

Participants in the DEER Distribution and Interconnection R&D area are working with industry and utility organizations to develop, through the Institute of Electrical and Electronics Engineers (IEEE), uniform national standards for interconnecting distributed resources with electric power systems.

Reinventing the Electric Distribution System through SMARTConnect™*



Integrating Distributed Energy Resources & Technologies with the Electric Grid

DEER: <http://www.eren.doe.gov/der.html>
DOE Office of Distributed Energy Resources: <http://www.eren.doe.gov/>
Distribution and Interconnection R&D (Formerly Distributed Power Program): <http://www.eren.doe.gov/dip/interconnect/>
*SMARTConnect™ — enabling a modernized, reliable, highly automated, and more efficient electric power distribution system through increased use of distributed energy resources

Standards Development and Technology Standardization

- Fosters quality design and manufacture
- Increases competitiveness in industry
- Creates and expands markets
- Facilitates trade and commerce
- Safeguards against hazards

IEEE Standards Development

- IEEE is an international membership organization, with nearly 900 active standards and 700 under development.
- IEEE supports an industry-driven consensus process for establishing standards.
- IEEE standards development areas include:
 - Power and Energy, e.g., SCC21 P1547 Work Groups
 - Information Technology
 - National Electrical Safety Code
 - Reliability
 - Power Electronics

IEEE SCC21 P1547 Series of Interconnection Standards



The above identifies existing IEEE SCC21 standards development projects (P1547 series) and potential activities under discussion by SCC21 Work Group members.

Institute of Electrical and Electronics Engineers (IEEE)

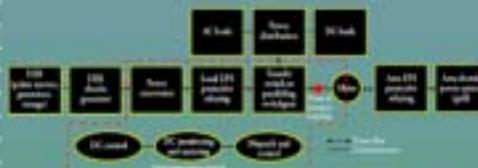
- IEEE is a nonprofit, technical professional association. It is transactional in scope and purpose and has 377,888 members in 379 countries.
- Through its members, IEEE is a leading authority in technical areas, advances the theory and application of electric technology and allied sciences, and serves as a catalyst for technological innovation.
- Through technical publishing, conferences, and consensus-based standards activities, IEEE:
 - Publishes 30% of the world's published literature in electrical engineering, computers, and control technology.
 - Annually holds more than 300 major conferences.
 - Has nearly 900 active standards and 700 under development.

IEEE — <http://standards.ieee.org/>

IEEE Standards Coordinating Committee 21 (SCC21)

SCC21 oversees the development of standards in the areas of Fuel Cells, Photovoltaics, Distributed Generation, and Energy Storage, and coordinates efforts in these fields among the various IEEE societies and other affected organizations to ensure that all IEEE standards are consistent and properly reflect the views of all applicable disciplines, and SCC21 reviews all proposed IEEE standards in these fields before their submission to the IEEE Standards Association Standards Board for approval and consensus submission to other organizations. IEEE SCC21 Fuel Cells, Photovoltaics, Distributed Generation, and Energy Storage: <http://groups.ieee.org/groups/cc21/>

Interconnection System Functions



Standardized Interconnection Systems**

- Standardize design, engineering, implementation, interoperability, and installation.
- Reduce installation quality and reliability variations.
- Simplify maintenance, re-standards, permitting, and rules.
- Promote advanced communication and software platforms.
- Enable advanced grid intelligence.

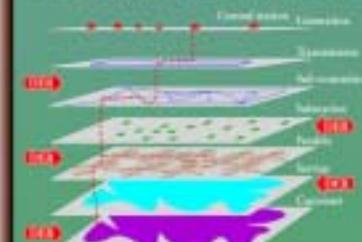
IEEE Std. 1547-2018 Distributed Energy Resources Interconnection System Technology: Review and Research Study in www.ieee.org/standards



Universal Interconnection Technology (UIT)**

The UIT is envisioned as an open architecture for a modernized, highly integrated, modular interconnection technology that will come as close as possible to "plug and play" for all distributed energy resource platforms and a wide variety of applications. IEEE Std. 1547-2018, IEEE Standard Interconnection Technology: Workshop Proceedings, July 27-28, 2018, www.ieee.org/standards

Integrated Grid Applications



Uniformly Interconnecting DER Provides Global Benefits



National Standards — Worldwide Recognition

IEEE and the International Electrotechnical Commission (IEC) agreed on a dual-logo — IEC and IEEE — arrangement for IEC to adopt IEEE electronics, telecom, and power generation standards for international use.

International Standards

- International standards help improve global industrial efficiency and develop world trade.
- International standards provide the framework for economies of design, greater product and service quality, more interoperability, and better production and delivery efficiency.
- IEC conformity assessment and product certification schemes at the national level ensure a certified product has been manufactured and type-tested to well-established international standards. The end-user is assured the product meets quality standards and need not be concerned with further testing or evaluation of the product.

IEEE — <http://standards.ieee.org/> IEC — <http://www.iec.ch>